ORDER NO. SD82032144C2

Service Manual

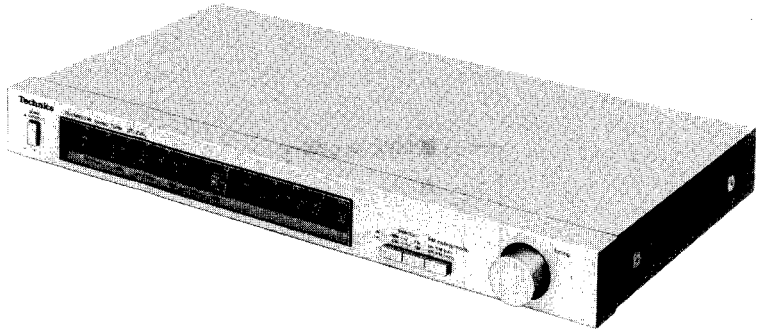
FM/MW/LW Stereo Tuner

ST-Z25L

[EX], [EK], [EF], [EB]

ST-Z25L(K)

[EX]



* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Areas

* [EX] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [EF] is available in France.
* [EB] is available in Belgium.

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ FM TUNER SECTION

Frequency range	88~108 MHz
Sensitivity	2.0 μV (IHF, usable)
S/N 30 dB	2.0 μV (300Ω), 1.0 μV (75Ω)
S/N 26 dB	1.8 μV (300Ω), 0.9 μV (75Ω)
S/N 20 dB	1.6 μV (300Ω), 0.8 μV (75Ω)
IHF 46 dB stereo quieting sensitivity	22 μV/75Ω
Total harmonic distortion	
MONO	0.15%
STEREO	0.3%
S/N	
MONO	70 dB (78 dB, IHF)
STEREO	65 dB (70 dB, IHF)
Frequency response	20 Hz~15 kHz, +0.5 dB~ −1.5 dB
Alternate channel selectivity	
normal (±400 kHz)	65 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	70 dB
Spurious response rejection at 98 MHz	80 dB
AM suppression	50 dB
Stereo separation	
1 kHz	40 dB
10 kHz	30 dB
Carrier leak	
19 kHz	−30 dB (−35 dB, IHF)
38 kHz	−45 dB (−50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	300Ω (balanced) 75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	
MW	525~1605 kHz
LW	145~350 kHz
Sensitivity (S/N 20 dB)	
MW	20 μV, 300 μV/m
LW	50 μV
Selectivity (± 9kHz)	
MW	27 dB (1000 kHz)
LW	35 dB (250kHz)
Image rejection	
MW	40 dB (1000 kHz)
LW	40 dB (250 kHz)
IF rejection	
MW	65 dB (1000 kHz)
LW	40 dB (250 kHz)

■ GENERAL

Output voltage	0.3V (0.6V, IHF)
Power consumption	8W
Power supply	AC 50 Hz/60 Hz, 220V (For continental Europe) AC 50 Hz/60 Hz, 240V (For United Kingdom)
Dimensions (W×H×D)	430 × 53 × 251 mm (16-15/16" × 2-3/32" × 9-7/8")
Weight	2.7 kg (6.0 lb.)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

ST-Z25L

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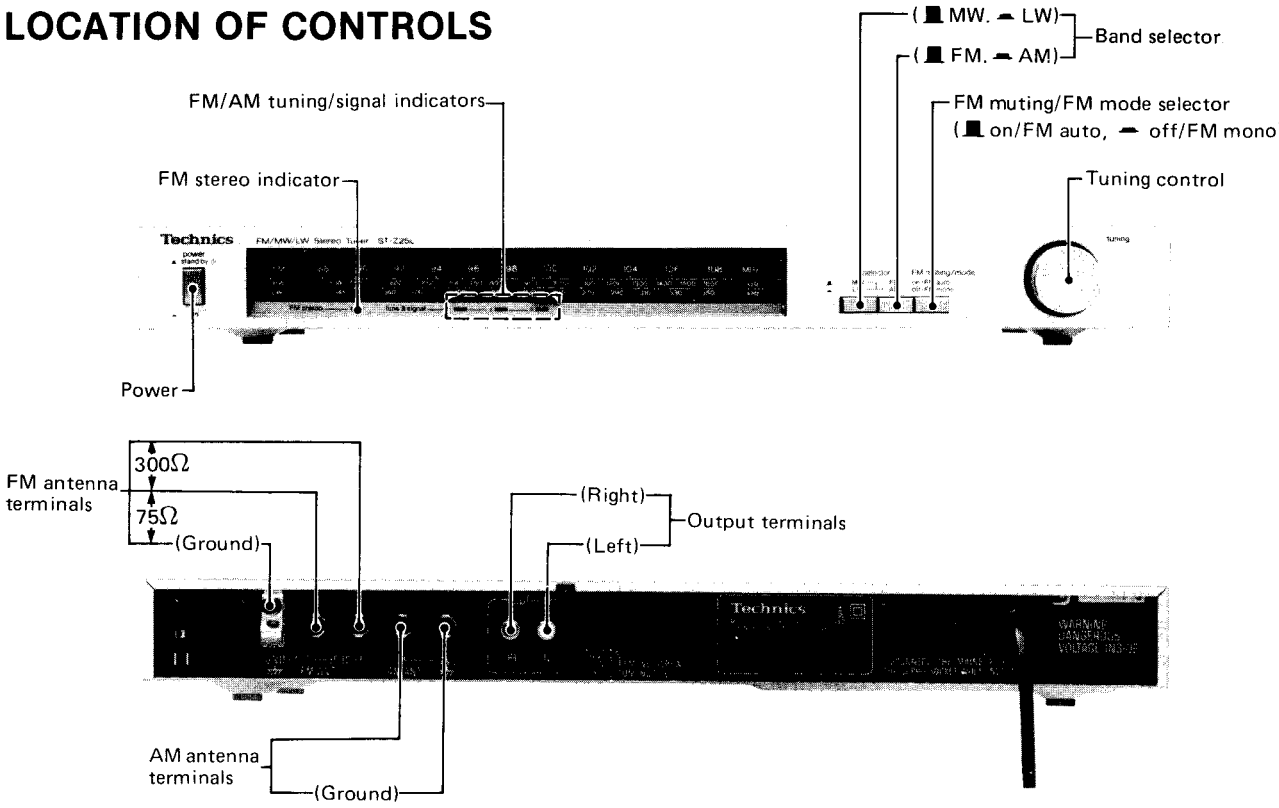
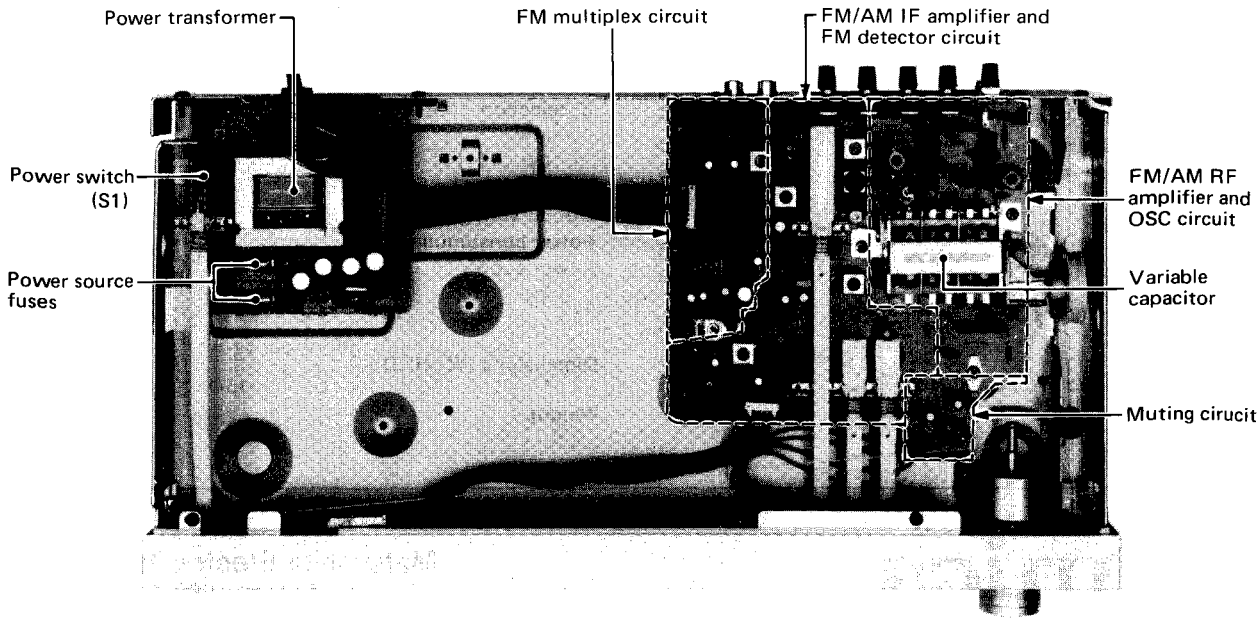
■ LOCATION OF CONTROLS



- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different.

* 220V (50/60 Hz) for continental Europe.

* 240V (50/60 Hz) for United Kingdom.



ORDER NO. SD82032144C2-A

FM/MW/LW Stereo Tuner ST-Z25L/ST-Z25L(K)

- This booklet contains the specifications and adjusting procedures for ST-Z25L, written in Germany, French and Spanish.
- File this manual together with the ST-Z25L service manual (Order No. SD82032144C2).

DEUTSCH

■ TECHNISCHE DATEN

Spezifikationen Können infolge von Verbesserungen ohne Ankündigung geändert werden.

(DIN 45 500)

■ UKW-TUNERTEIL

Wellenbereich	88 ~ 108 MHz
Eingangsempfindlichkeit	2,0 μV (nutzbar nach IHF)
S/R 30 dB	2,0 μV (300 Ω), 1,0 μV (75 Ω)
S/R 26 dB	1,8 μV (300 Ω), 0,9 μV (75 Ω)
S/R 20 dB	1,6 μV (300 Ω), 0,8 μV (75 Ω)
Stereoumschaltschwelle bei 46 dB nach IHF	22 μV/75 Ω
Gesamtklirrfaktor	
Mono	0,15%
Stereo	0,3%
Geräuschabstand	
Mono	70 dB (78 dB nach IHF)
Stereo	65 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+0,5 dB ~ −1,5 dB)
Trennschärfe bei Störsender normal (±400 kHz)	65 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
ZF-Dämpfung bei 98 MHz	70 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB
AM-Unterdrückung	50 dB
Übersprechdämpfung 1 kHz	40 dB
10 kHz	30 dB
Trägerrest 19 kHz	−30 dB (−35 dB nach IHF)
38 kHz	−45 dB (−50 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,5 dB
Begrenzereinsatz	1,2 μV
Bandbreite ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	300 Ω (symmetrisch), 75 Ω (unsymmetrisch)

■ AM-TUNERTEIL

Wellenbereiche	
MW	525 ~ 1605 kHz
LW	145 ~ 350 kHz
Eingangsempfindlichkeit (S/R 20 dB)	
MW	20 μV, 300 μV/m
LW	50 μV
Trennschärfe (± 9kHz)	
MW	27 dB (1000 kHz)
LW	35 dB (250 kHz)
Spiegelfrequenz-Dämpfung	
MW	40 dB (1000 kHz)
LW	40 dB (250 kHz)
ZF-Dämpfung	
MW	65 dB (1000 kHz)
LW	40 dB (250 kHz)

■ ALLGEMEINE DATEN

Ausgangsspannung	0,3V (0,6V, IHF)
Leistungsaufnahme	8W
Netzspannung	Wechselstrom 50Hz/60Hz, 220V (Für Kontinentaleuropa) Wechselstrom 50Hz/60Hz, 110V/120V/220V/240V (Für andere Länder)
Abmessungen (B×H×T)	430 × 53 × 251 mm
Gewicht	2,7 kg

■ MESSUNGEN UND JUSTIERUNGEN

- Beim Abgleichen der hohen Frequenz ist zuerst die Spule abzugleichen (Abgleich der niedrigen Frequenz), und dann allmählich der lose Trimmer anzuziehen, um den Abgleich der hohen Frequenz vorzunehmen. Für den Abgleich der Oszillationsspule und des ZFT ist ein nichtmetallischer Schraubenzieher zu verwenden.
- Den Anzeiger vor dem Abgleich unbedingt auf den Startpunkt einstellen. (Siehe Abb. 12)

- **Stellungen und zu benutzende Geräte**

1. Elektronische Voltmeter für Wechsel-und Gleichstrom (VTVM).
2. AM (MW)-Meßsender (AM-SG)
3. UKW-Meßsender (FM-SG)
4. Oszilloskop
5. Signalfrequenzmesser (meßbar für 19kHz und 108MHz).
6. Bereichsschalter ..... AM (MW/LW Abgleich)
   FM (UKW Abgleich)
7. FM Muting/Mode Schalter..... off/FM mono.
8. Die Netzspannung auf ihren Sollwert einstellen.
9. UKW-Kunstantenne, 300 ohm . . . Vgl. Abb. 13.
10. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute ablesung.

- **Vorbereitung AM UKW-Messender (FM-SG)**

1. Stereo-Modulator an FM-SG anschließen.
2. SG-Ausgang über 300-ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen.
3. Der normale Eingang des Gerätes beträt 60 dB (1mV), 400 Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signalausgang 12 dB plus (IHF) sein: d.h. beim Eingang von 60 dB soll der Signalausgang 72 dB sein.)

Nr.	AM MESSENDER ANSCHLUSS	AM MESSENDER FREQUENZ	SKALENZEIGEREINSTELLUNG DES TUNER	ANZEIGEGEIRÄT (Röhrenvoltmeter order Oszillograph)	ABGLEICHSPUNKTE	BEMERKUNGEN
	AM (MW/LW)-ZF-ABGLEICH					
1	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400 Hz Modulat., 30%)	Kein Empfang	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	T201 (1. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adustieren, daß der Ausgang den maximalen Wert erreicht.
	MW-HF-ABGLEICH					
2	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	600kHz (400 Hz Modulat., 30%)	600kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	L203 (MW Osc. Spule) L202 (MW Ant. Spule)	• Auf max. Ausgang abgleichen.
3		1500kHz (400 Hz Modulat., 30%)	1500kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	CT201 (MW Osc. Trimmer)	• Auf max. Ausgang abgleichen. • Schritt (2) und (3) sind zu wiederholen.
	LW-HF-ABGLEICH					
4	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	145kHz (400 Hz Modulat., 30%)	145kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	L252 (LW Osc. Spule) L251 (LW INT Ant. Spule)	• Auf max. Ausgang abgleichen.
5		350kHz (400 Hz Modulat., 30%)	350kHz	Wechselstrom Röhrenvoltmeter oder Oszillograph über den Ausgang "OUTPUT" schließen.	CT251 (LW Osc. Trimmer)	• Auf max. Ausgang abgleichen. • Schritt (4) und (5) sind zu wiederholen.
	UKW-ZF-ABGLEICH					
6	———	Kein Signal	Kein Empfang	Ein Gleichstromröhrenvoltmeter zwischen TP101 und TP102 über eine Drosselspule verbinden (siehe Abb. 14)	T101 (Diskriminator FT)	• FM muting/FM mode. Schalter, auf "on/FM auto" stellen. • Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0mV im 300mV Bereich beträgt.
	UKW-HF-ABGLEICH					
7	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	87.5MHz (400 Hz Modulat., 100%) Schwacher Eingang)	87.5MHz (Frequenzmin.)	Oszillograph über den Ausgang "OUTPUT" schließen.	L4 (Osc. Spule)	• Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. • So einstellen, daß die Ausgangswellenform vertikal symmertrisch wird. (Abb. 15) • Die Einstellung von (7), (8) und (9) wieder holen, bis die Frequenz mit der Skala übereinstimmt.
8		90MHz (400 Hz Modulat., 100%) Schwacher Eingang	90MHz	Oszillograph über den Ausgang "OUTPUT" schließen.	L1 (Ant. Spule) L2 (Det. Spule)	
9		106MHz (400 Hz Modulat., 100%) Schwacher Eingang)	106MHz	Oszillograph über den Ausgang "OUTPUT" schließen.	CT1 (Osc. Trimmer)	
	UKW-STEREO-DEKODER-ABGLEICH					
10	UNTER VERWENDUNG EINES ZÄHLERS 1. Unmoduliertes Mono-Signal 100MHz in das Gerät speisen. 2. FM muting/mode-Schalter auf "on/FM auto" stellen. 3. Zähler über einen Widerstand 100k ohm an TP301 schließen. 4. **VR301** auf 19kHz ± 30 Hz einstellen.			ALTERNATIV-MEß METHODE 1. Stereosignal entweder von einem Stereogenerator. oder einem Sender einspeisen. 2. **VR301** so einstellen, bis die Stereolampe auf leuchtet. Schleifer von **VR301** sichern, wie in Abb. 16 gezeigt.		

FRANÇAIS

■ CARACTERISTIQUES

Sujet á changement sans prearis.

(DIN 45 500)

■ SECTION SYNTONISATEUR FM

Gamme de fréquence	88~108 MHz
Sensibilité	2,0 μV (IHF utilisable)
S/B 30 dB	2,0 μV (300Ω), 1,0 μV (75Ω)
S/B 26 dB	1,8 μV (300Ω), 0,9 μV (75Ω)
S/B 20 dB	1,6 μV (300Ω), 0,8 μV (75Ω)
Sensibilité stéréo au seuil de 46 dB, IHF	22 μV/75Ω
Distorsion harmonique totale	
MONO	0,15%
STEREO	0,3%
Signal/Bruit	
MONO	70 dB (78 dB, IHF)
STEREO	65 dB (70 dB, IHF)
Réponse de fréquence	20 Hz~15 kHz, +0,5 dB~ −1,5 dB
Sélectivité alternée par canal	
normal (±400 kHz)	65 dB
Taux de capture	1,0 dB
Rejection d'image à 98 MHz	55 dB
Rejection FI à 98 MHz	70 dB
Rejection de réponse parasite à 98 MHz	80 dB
Suppression AM	50 dB
Séparation stéréophonique	
1 kHz	40 dB
10 kHz	30 dB
Fuite de porteuse	
19 kHz	−30 dB (−35 dB, IHF)
38 kHz	−45 dB (−50 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	±1,5 dB
Point de limite	1,2 μV
Largeur de bande	
Amplificateur FI	180 kHz
Démodulateur FM	1000 kHz
Bornes d'antenne	300Ω (symétrique)
	75Ω (asymétrique)

■ SECTION SYNTONISATEUR AM

Gamme de fréquence	
PO (MW)	525~1605 kHz
GO (LW)	145~350 kHz
Sensibilité (S/B 20 dB)	
PO (MW)	20 μV, 300 μV/m
GO (LW)	50 μV
Sélectivité (±9 kHz)	
PO (MW)	27 dB (1000 kHz)
GO (LW)	35 dB (250 kHz)
Réjection d'image	
PO (MW)	40 dB (1000 kHz)
GO (LW)	40 dB (250 kHz)
Réjection FI	
PO (MW)	65 dB (1000 kHz)
GO (LW)	40 dB (250 kHz)

■ DIVERS

Tension de sortie	0,3V (0,6V, IHF)
Consommation	8W
Alimentation	220V
Dimensions (L×H×Pr)	430 × 53 × 251 mm
Poids	2,7 kg

■ MESURAGES ET RÉGLAGES

- Lorsque l'on régle la haute fréquence, régler tout d'abord la bobine (mise au point de la fréquence inférieure), puis graduellement resserrer le condensateur d'appoint desserré pour effectuer le réglage de la haute fréquence. Utiliser un tournevis non-métallique lorsque l'on régle la bobine oscillatrice et IFT (transformateur de fréquence intermédiaire).
- S'assurer que l'indicateur est réglé sur le point de départ avant d'effectuer la mise au point. (Voir Fig. 12)

- **Réglage et équipement utilisé**
1. Voltmètres électronique de courant alternatif et de courant continu (VTVM).
2. Générateur du signal AM (AM-SG).
3. Générateur du signal FM (FM-SG).
4. Oscilloscope
5. Compteur de fréquence (19kHz et 108MHz mesurable).
6. Sèlecteur de gamme. . . . . {AM (Alignement MW/LW) / FM (Alignement FM)
7. Commutateur de silencieux/mode. . . . off/FM mono.
8. Conserver la tension du secteur à la tension nominale.
9. Antenne fictive FM 300Ω. . . . . Voir fig. 13.
10. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.

- **Préparation du générateur de signal FM (FM-SG)**
1. Brancher la commande de réglage stéréophonique à FM-SG.
2. Alimenter la sortie SG à la borne de l'antenne de l'appareil, par l'antenne fictive FM, 300 ohms.
3. L'entrée standard de l'appareil est de 60 dB (1mV), 400Hz, 100% de modulation (à cause de l'utilisation de l'antenne fictive, la sortie SG doit être de plus 12 dB (IHF). Ce qui signifie que quand l'entrée est de 60 dB, la sortie SG doit être de 72 dB).

No.	AM GENERATEUR BRANCHEMENT	AM GENERATEUR FREQUENCE	AIGUILLE SUR LE CADRAN	INDICATEUR (VOLTMETRE ELECTRONIQUE OSCILLOSCOPE)	POINTS DE REGLAGE	OBSERVATIONS
	RÉGLAGE DE FI-MW (PO)-LW (GO)					
1	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis (Entrée sous puissante)	450kHz (modulè à 30% par 400 Hz)	Point sans signal	C.A. voltmètre èlectronique ou oscilloscope sur prise de sortie de l'appareil.	T201 (1 transfo FI)	• Régler la fréquence d'entrée et les points de réglage de tells sorte que la sortie devienne maximale.

No.	AM GENERATEUR BRANCHEMENT	AM GENERATEUR FREQUENCE	AIGUILLE SUR LE CADRAN	INDICATEUR (VOLTMETRE ELECTRONIQUE OSCILLOSCOPE)	POINTS DE REGLAGE	OBSERVATIONS
	RÉGLAGE DE RF-MW (PO)					
2	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	600kHz (modulé à 30% par 400 Hz)	600kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	L203 (bobine OSC MW) L202 (bobine ANT MW)	• Réglez au maximum de signal de sortie.
3		1500kHz (modulé à 30% par 400 Hz)	1500kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	CT201 (trimmer OSC MW)	• Réglez au maximum de signal de sortie. • Recommencez les étapes (2) et (3).
	ALIGNEMENT RF-LW (GO)					
4	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	145kHz (modulé à 30% par 400 Hz)	145kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	L252 (bobine OSC LW) L251 (bobine ANT LW INT)	• Réglez au maximum de signal de sortie.
5		350kHz (modulé à 30% par 400 Hz)	350kHz	C.A. voltmètre électronique ou oscilloscope sur prise de sortie de l'appareil.	CT251 (trimmer OSC LW)	• Réglez au maximum de signal de sortie. • Recommencez les étapes (4) et (5).
	RÉGLAGE DE FI-FM					
6	———	Sans signal	Point sans signal	Brancher le voltmétre électronique à C.C. aux bornes TP101 et TP102 (Voir la fig. 14)	T101 (Transfo FI discri.)	• Commutateur de silencieux sur "on/FM auto". • Régler le noyau T101 de telle sorte que le voltage mesuré dans le mode sans signal, soti de 0mV dans la gamme des 300mV.
	RÉGLAGE DE RF-FM					
7	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	90 MHz (modulé à 100% par 400 Hz) Entrée faible	90 MHz	Oscilloscope sur prise de sorite du tuner.	L4 (bobine OSC) L1 (bobine ANT) L2 (bobine DET)	• Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. • Faire le réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 15) • Refaire les réglages (7) et (8) jusqu'à ce que la fréquence corresponde correctement avec l'échells du cadran.
8		106 MHz (modulé à 100% par 400 Hz) Entrée faible	106 MHz	Oscilloscope sur prise de sortie du tuner.	CT1 (trimmer OSC)	
	RÉGLAGE PILOTE MULTIPLEX FM					
9	AVEC UN ERÉQUENCEMÉNTRE 1. Signal mono 100MHz non modulé appliqué à l'appareil. 2. Commutateur de silencieux sur "on/FM auto". 3. Branchez le fréquencemètre sur TP301 à travers une 4. Régler **VR301** sur 19kHz ± 30 Hz.			PAR UN OUTRE SYSTÈME 1. Appliquez à l'appareil un signal stéréo provenant d'un générateur ou de la réception d'un émetteur. 2. Régler **VR301** jusqu à ce que l'indicateur de stéréophonic s'allume. Collez le curseur le **VR301** comme indiqué sur la fig. 16.		

ESPAÑOL

■ ESPECIFICACIONES

Estas especificaciones están sujetas a cualquier cambio sin previo eviso.

(DIN 45 500)

■ SECCION PARA SINTONIZADOR FM

Gama de frecuencias	88~108 MHz
Sensibilidad	2,0 μV (IHF, utilizable)
Señal a ruido 30 dB	2,0 μV (300Ω), 1,0 μV (75Ω)
Señal a ruido 26 dB	1,8 μV (300Ω), 0,9 μV (75Ω)
Señal a ruido 20 dB	1,6 μV (300Ω), 0,8 μV (75Ω)
Sensibilidad de acallamiento estéreo de 46 dB IHF	22 μV/75Ω
Distorsión armónica total	
MONO. (MONO)	1,5%
ESTEREO (STEREO)	0,3%
Relación de señal a ruido	
MONO. (MONO)	70 dB (78 dB, IHF)
ESTEREO (STEREO)	65 dB (70 dB, IHF)
Respuesta de frecuencia	20 Hz~15 kHz, +0,5 dB~ −1,5 dB
Selectividad alternada de canal normal ±400 kHz)	65 dB
Relación de captura	1,0 dB
Rechazo de imagen a 98 MHz	55 dB
Rechazo de F.I. a 98 MHz	70 dB
Rechazo de respuesta espuria a 98 MHz	80 dB
Supresión AM	50 dB

Separación estereofónica	
1 kHz	40 dB
10 kHz	30 dB
Fuga de onda portadora	
19 kHz	−30 dB (−35 dB, IHF)
38 kHz	−45 dB (−50 dB, IHF)
Equilibrio de canales 250 Hz~6 300 Hz	±1,5 dB
Punto de límite	1,2 μV
Ancho de banda	
Amplificador FI	180 kHz
Demodulador FM	1000 kHz
Bornes de antena	300Ω (equilibrado), 75Ω (no equilibrado)
■ SECCION PARA SINTONIZADOR AM	
Gama de frecuencias	
OM (MW)	525~1605 kHz
OL (LW)	145~350 kHz
Sensibilidad (Relación de señal a ruido de 20 dB)	
OM (MW)	20 μV, 300 μV/m
OL (LW)	50 μV
Selectividad (± 9kHz)	
OM (MW)	27 dB (1000 kHz)
OL (LW)	35 dB (250 kHz)
Rechazo de imagen	
OM (MW)	40 dB (1000 kHz)
OL (LW)	40 dB (250 kHz)
Rechazo de F.I.	
OM (MW)	65 dB (1000 kHz)
OL (LW)	40 dB (250 kHz)
■ GENERAL	
Voltaje de salida	0,3V (0,6V, IHF)
Consumo de energía	8W
Requisito de energía	AC 50Hz/60Hz, 220V (Para Europa continental) CA 50Hz/60Hz, 110V/120V/220V/240V (Para otros países)
Dimensiones (An.×Al.×Prof.)	430 × 53 × 251 mm
Peso	2,7 kg

■ MEDICIONES Y AJUSTE

- Al ajustar la alta frecuencia, primero ajustar la bobina (ajuste de frecuencia inferior) y entonces, gradualmente, apretar el trimer flojo para efectuar el ajuste de alta frecuencia. Utilizar un destornillador no metálico al ajustar la bobina de oscilación y IFT (transformador de frecuencia intermedia).
- Asegurarse de que el indicador está puesto en el punto de arranque antes del ajuste. (Véase la Fig. 12.)

- **Puesta y Uso de equipo**
1. Voltimetros electónicos de CA y CC (VTVM).
2. Generador de señales AM (AM-SG).
3. Generador de señales FM (FM. SG).
4. Osciloscopio.
5. Frecuencimetro (19kHz y 108MHz medibles).
6. Selector de bande . . . . . {AM (Ajuste de MW/LW) {FM (Ajuste de FM)
7. Interruptor silenciador/modalidad FM . . . . . off/mono.
8. Mantener voltaje de línea a voltaje nominal.
9. Antena ficticia de 300Ω FM. . . . . Referir a Fig. 13.
10. La salida de generador de señales no debe ser mayor que la necesaria para obtener una lectura de salida.

- **Preparación de generador de señales FM (FM. SG).**
1. Conectar modulador estereofónico a FM. SG.
2. Aplicar salida SG a terminal de antena del aparato a través de antena ficticia de 300Ω FM.
3. La entrada standard del aparato es 60dB (1mV), modulación 100% 400Hz (Por el uso de antena ficticia, la salida de SG ha de ser 12dB más (IHF). Es decir, cuando entrada es 60dB, salida de SG ha de ser 72dB).

	AM/FM GENERADOR DE SEÑALES		A FRECUENCIA DE PRESENTACION	PREPARACIONES	PIEZAS AJUSTADAS	PROCEDIMIENTO DE AJUSTE
	CONEXION	FRECUENCIA				
	AJUSTE IF-MW (OM)-LW (OL)					
1	Conectar AM-SG a terminal de antena AM a través de capacitor 200pF. Común a chasis. (Entrada potente.)	450kHz (Mod. 30% con 400Hz)	Punto de no interferencia.	Conecart VTVM de CA u osciloscopio a terminales de "OUTPUT" (altavoz).	T201 (IFT AM)	Ajuste la frecuencia de entrada y el punto de ajuste de manera que la salida se convierta en máxima.
	AJUSTE RF-MW (OM)					
2	Conectar AM-SG a terminal de antena AM a través de capacitor 200pF. Común a chasis. (Entrada débil).	600kHz (Mod. 30% con 400Hz)	600kHz	Conectar VTVM de CA u osciloscopio a terminales de "OUTPUT".	L203 (Bobina OSC MW) L202 (Bobina ANT MW)	• Ajustar para salida máxima.
3		1500kHz (Mod 30% con 400Hz)	1500kHz	Conectar VTVM de CA u osciloscopio a terminales de "OUTPUT".	CT201 (Trimer de OSC AM)	• Ajustar para salida máxima. • Repetir pasos (1) y (2).
	AJUSTE RF-LW (OL)					
4	Conectar AM-SG a terminal de antena AM a través de capacitor 200pF. Común a chasis. (Entrada débil).	145kHz (Mod. 30% con 400Hz)	145kHz	Conectar VTVM de CA u osciloscopio a terminales de "OUTPUT".	L252 (Bobina OSC LW) L251 (Bobina ANT LW)	• Ajustar para salida máxima.
5		350kHz (Mod. 30% con 400Hz)	350kHz	Conectar VTVM de CA u osciloscopio a terminales de "OUTPUT".	CT251 (Trimer de OSC LW)	• Ajustar para salida máxima. • Repetir pasos (4) y (5).

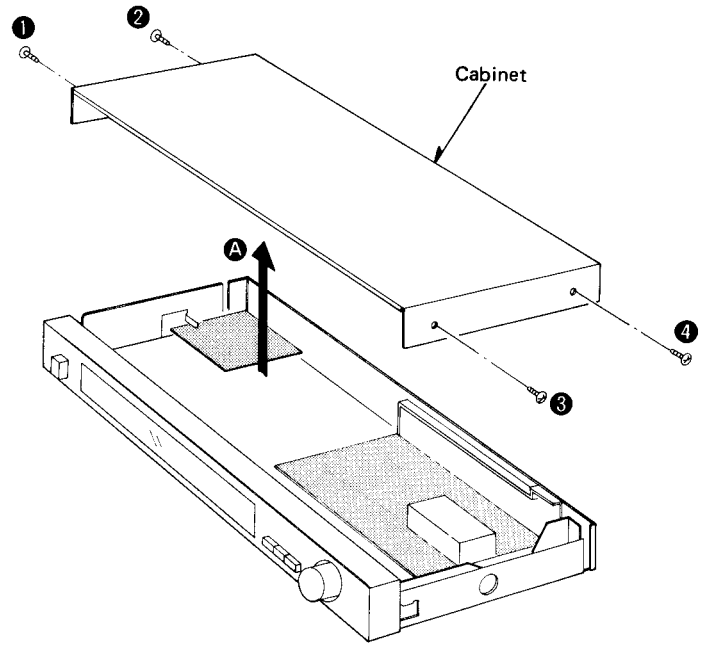
	AM/FM GENERADOR DE SEÑALES		A FRECUENCIA DE PRESENTACION	PREPARACIONES	PIEZAS AJUSTADAS	PROCEDIMIENTO DE AJUSTE
	CONEXION	FRECUENCIA				
	AJUSTE IF-FM					
6	———	No señal.	Punto de no interferencia.	Conectar VTVM CC entre terminal TP101 y TP102 a través de bobina de choque. (Referir a Fig. 14).	T101 (Discri. IFT)	• Ajustar núcleo de T101 de manera que voltaje medido en modalidad de señal se 0mV en gama de 300mV.
	AJUSTE RF. FM					
7	Conectar FM. SG a terminal de antena FM a través de antena ficticia de 300Ω FM.	90MHz (Mod. 100% con 400Hz) Entrada débil.	90MHz	Conectar osciloscopio a terminal de "OUTPUT".	L4 (Bobina OSC) L1 (Bobina ANT) L2 (Bobina DET RF)	• Añadir entrada débil de manera que ruido se incluya en la forma de onda de salida. • Hacer el ajuste de manera que la forma de onda de salida sea verticalmente simétrica. (Fig. 15). • Repetir los pasos (7) y (8) hasta que la frecuencia se adapte correctamente a la escala del cuadrante.
8		106MHz (Mod. 100% con 400Hz) Entrada débil.	106MHz	Conectar osciloscopio a terminal de "OUTPUT".	CT1 (Trimer OSC)	
	AJUSTE DE V.C.O MPX de FM					
9	USANDO UN FRECUENCIMETRO 1. Señal mono no modulada de 100MHz 60dB aplicada al aparato. 2. Interruptor de modalidad/sinlenciador FM a "on/auto FM". 3. Conectar frecuéncimetro a TP301 a través de resistor (100kΩ). 4. Ajustar **VR301** a 19kHz ± 30Hz.			USANDO SISTEMA ALTERNATIVO 1. Aplicar señal estereofónica de generador o estación estereofónica a sintonfizador. 2. Ajustar **VR301** hasta que indicador estereofónico se ilumina. Brazo de cemento de **VR301** como se muestra en la Fig. 16.		

Printed in Japan
82034600 Ⓗ YK/IM

■ DISASSEMBLY INSTRUCTIONS

- **How to remove the cabinet**

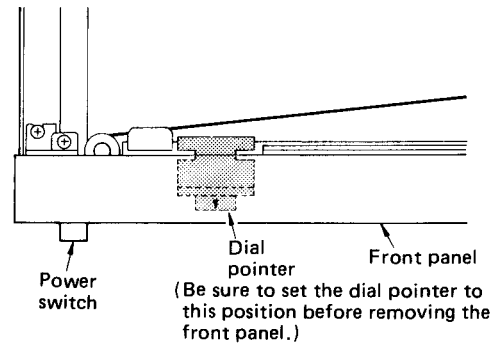
1. Remove the 4 setscrews (Fig. 1 : ❶ ~ ❹) on the cabinet.
2. Move the cabinet in the direction of the arrow Ⓐ in Fig. 1.



[Fig. 1]

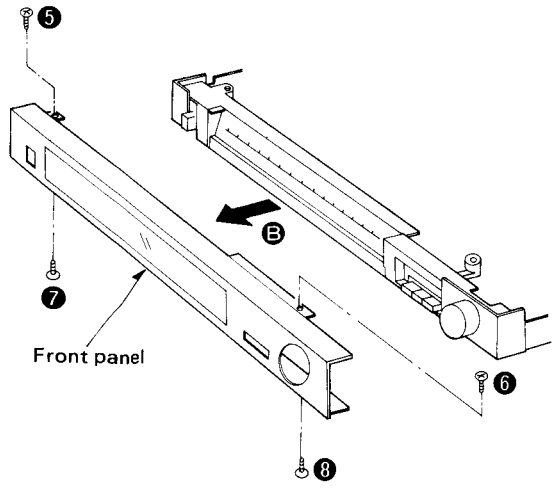
- **How to remove the front panel**

1. Remove the cabinet and set the dial pointer to the position as in Fig. 2. (Removing the front panel without setting the dial pointer to the position may cause damage to the dial pointer.)



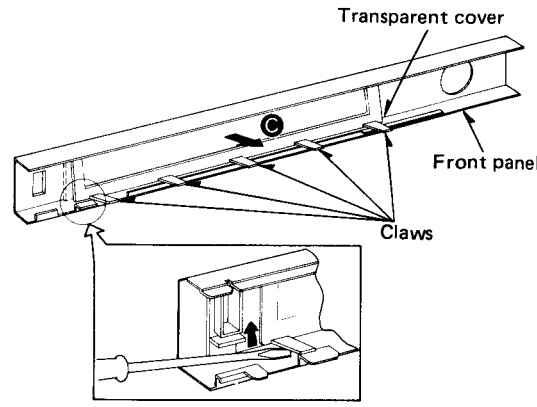
[Fig. 2]

2. Remove 4 setscrews of the front panel (Fig. 3 : ❺ ~ ❽) and remove the front panel in the direction of arrow Ⓑ.



[Fig. 3]

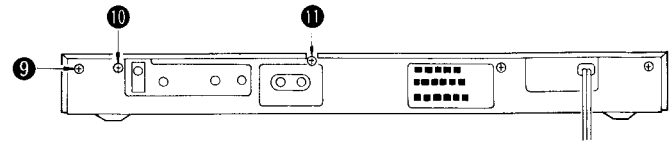
3. When removing the transparent cover, release the 5 claws with a screwdriver (See Fig. 4), and remove the transparent cover in the direciton of arrow Ⓒ.



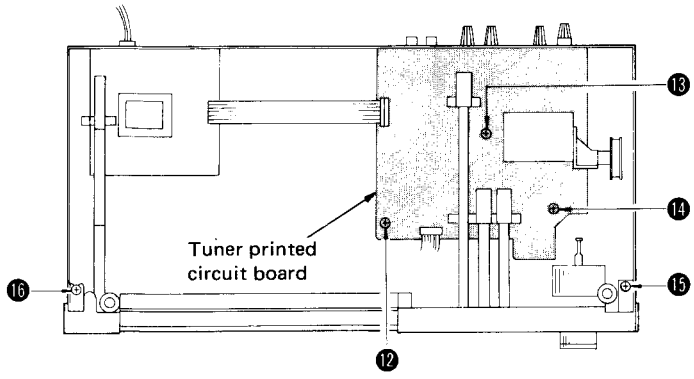
[Fig. 4]

- **How to remove the tuner printed circuit board**

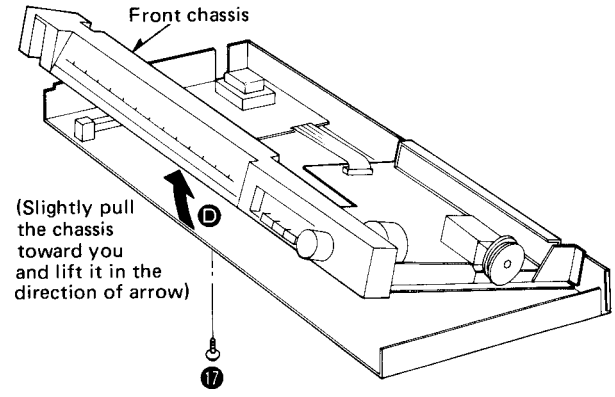
1. Remove the cabinet and front panel.
2. Remove 3 setscrews of the bracket and terminal board (Fig. 5 : ❾ ~ ⓫), 3 setscrews of the printed circuit board (Fig. 6 : ⓬ ~ ⓮), and 3 setscrews of the front chassis (Fig. 6 : ⓯ , ⓰ and Fig. 7 : ⓱).
3. Slightly pull the front chassis toward you and remove the printed circuit board in the direciton of arrow Ⓓ. (See Fig. 7)



[Fig. 5]



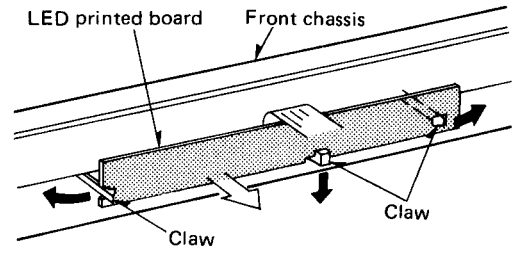
[Fig. 6]



[Fig. 7]

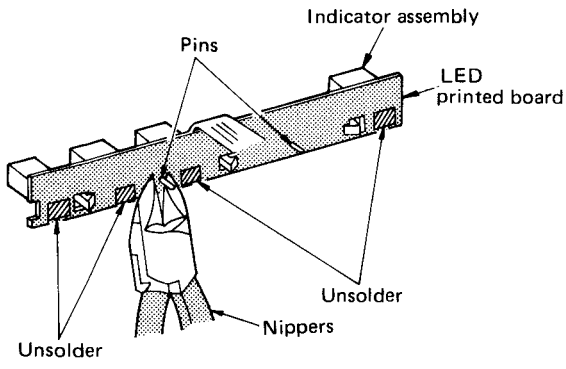
- **How to remove the FM stereo, tuning and signal indicator**

1. Remove the cabinet.
2. Replace 3 claws of the LED printed board (Fig. 8) and remove the LED printed board from the front chassis.



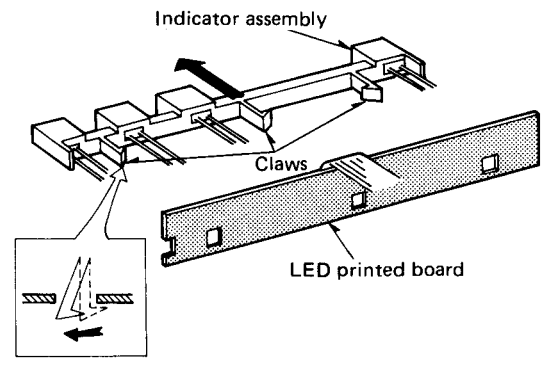
[Fig. 8]

3. Unsolder 4 portions of the indicator assembly and cut off the 2 pins connected to the indicator by use of nippers. (See Fig. 9)



[Fig. 9]

4. Release 3 claws of the indicator assembly and remove the indicator from the LED printed board. (Fig. 10)

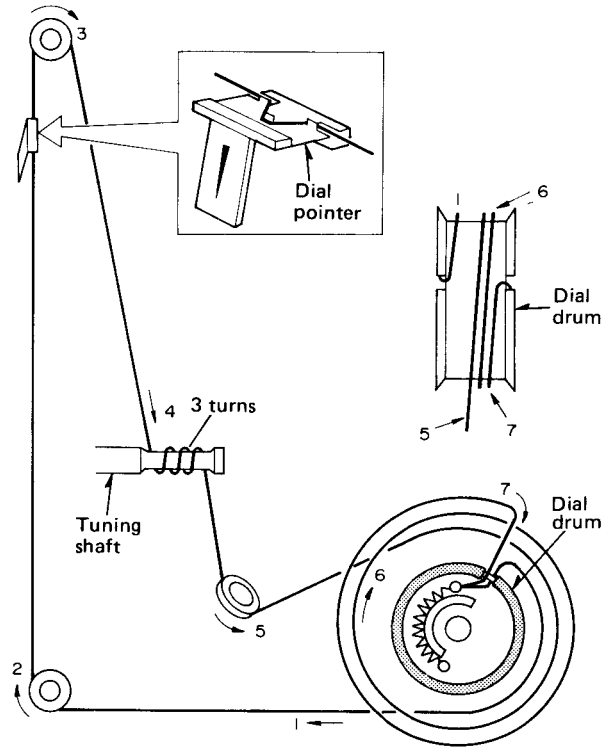


[Fig. 10]

■ DIAL CORD INSTALLATION GUIDE

For threading a fresh cord, proceed as follows.

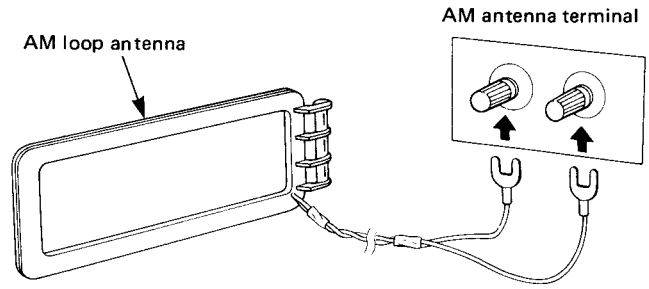
1. Prepare a fresh cord more than 180 cm (70-15/16") in length.
2. Bring the variable capacitor into a state where the drum is completely turned to the right (maximum capacity and lowest frequency for the variable capacitor).
3. Direct the cord in the order from 1 to 7.
4. Stretch the cord in such a tension as the spring length is elongated by 1.5 times that of the original state.
5. Fix the knot of the cord with the board.

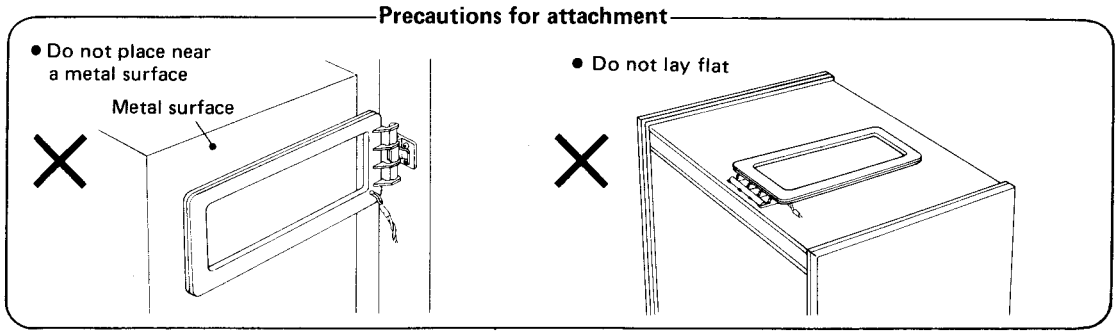


[Fig. 11]

■ AM LOOP ANTENNA

Since the unit does not employ the conventional AM bar antenna, be sure to connect the AM loop antenna to the AM antenna terminal on the back of the set when receiving AM antenna terminal. When the AM loop antenna is connected to the rear panel, place it as far away from the set as possible to improve the sensitivity.





■ BEFORE STARTING THE REPAIRING

The power switch of this unit is connected to the secondary side of the power transformer, Be sure to pull the power cord out of the socket before repair.

■ MEASUREMENTS AND ADJUSTMENTS

*When adjusting the high frequency, first adjust the coil (lower frequency adjustment) and then gradually tighten the loose trimmer to make the high frequency adjustment. Use a non-metallic screwdriver when adjusting the OSC coil and IFT.
*Make sure that the indicator is set at the start point before the adjustment. (See Fig. 12)

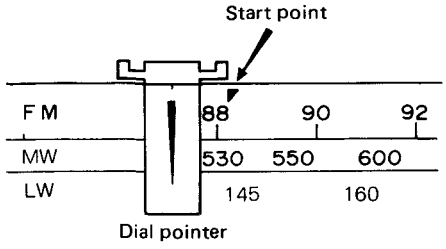
*** Setting and Equipment used**

1. AC and DC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. FM signal generator (FM-SG)
4. Oscilloscope
5. Frequency counter (19 kHz and 108 MHz measurable).
6. Band selector switch . . . . . { AM (MW/LW adjustment) / FM (FM adjustment)
7. FM muting/FM mode switch . . . . . off/FM mono
8. Maintain line voltage at rated voltage.
9. 300Ω FM dummy antenna . . . . . .Refer to Fig. 13
10. Output of signal generator should be no higher than necessary to obtain an output reading.

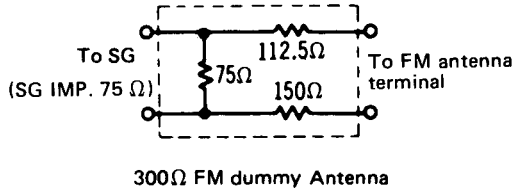
*** Preparation of FM signal generator (FM-SG)**

1. Connect stereo modulator to FM-SG.
2. Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna.
3. The standard input of the set is 60 dB (1mV), 400 Hz, 100% modulation (Because of using dummy antenna, SG output must be 12 dB plus (IHF). That is, when input is 60 dB, SG output is to be 72 dB)

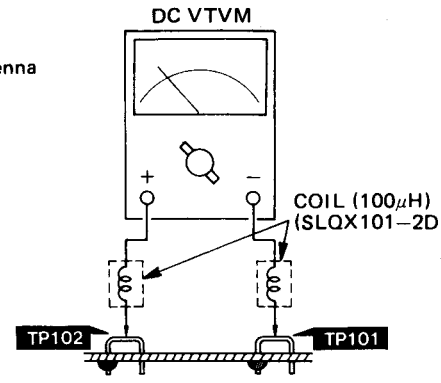
Step No.	AM/FM GENERATOR: CONNECTION	AM/FM GENERATOR: FREQUENCY	DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT POINTS	REMARKS
	AM-IF ADJUSTMENT					
1	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Powerful input)	450 kHz (30% Mod. with 400 Hz)	Point of non-inter-ference	Connect AC VTVM or scope to "OUTPUT" terminals.	T201 (AM IFT)	• Adjust the input frequency and adjustment points so that the output becomes maximum.
	MW -RF ADJUSTMENT				* Set band selector to "MW" position.	
2	Connect AM-SG to AM antenna terminal capacitor. Common to chassis. (Weak input)	600 kHz (30% Mod. with 400 Hz)	600 kHz	Connect AC VTVM or scope to "OUTPUT" terminals.	L203 (MW OSC Coil) L202 (MW ANT Coil)	• Adjust for maximum output.
3		1500 kHz (30% Mod. with 400 Hz)	1500 kHz	Connect AC VTVM or scope to "OUTPUT" terminals.	CT201 (MW OSC Trimmer)	• Adjust for maximum output. • Repeat steps (2) and (3).
	LW-RF ADJUSTMENT				* Set band selector to "LW" position.	
4	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	145kHz (30% Mod. with 400 Hz)	145kHz	Connect AC VTVM or scope to "OUTPUT" terminals.	L252 (LW OSC Coil) L251 (LW ANT Coil)	• Adjust for maximum output.
5		350kHz (30% Mod. with 400 Hz)	350kHz	Connect AC VTVM or scope to "OUTPUT" terminals.	CT251 (LW OSC Trimmer)	• Adjust for maximum output. • Repeat steps (4) and (5).
	FM-IF ADJUSTMENT					
6	———	No Signal	Point of non-inter-ference	Connect DC VTVM between TP101 and TP102 through choke coil. (Refer to Fig. 14)	T101 (Discri. IFT)	• FM muting/FM mode switch to "on/FM auto" position. • Adjust T101 core so that voltage measured in signal mode is 0mV in 300mV range.
	FM-RF ADJUSTMENT					
7	Connect to FM 300Ω antenna terminal through 300Ω FM dummy antenna.	90 MHz (100% Mod. with 400 Hz) weak input	90 MHz	Connect scope to "OUTPUT" terminal.	L4 (OSC Coil) L1 (ANT Coil) L2 (RF DET Coil)	• Add weak input so that noise is included in the output wave form. • Make the adjustment so that the output wave form is vertically symmetrical. (Fig. 15) • Repeat the steps (7) and (8) until the frequency correctly matches the dial scale.
8		106 MHz (100% Mod. with 400 Hz) weak input.	106 MHz	Connect scope to "OUTPUT" terminal.	CT1 (OSC Trimmer)	
	FM MPX V.C.O. ADJUSTMENT					
9	USING A FREQUENCY COUNTER 1. 100 MHz 60 dB Non-modulated mono signal applied to set. 2. FM muting/FM mode switch to "on/FM auto". 3. Connect frequency counter to TP301 through resistor (100kΩ). 4. Adjust TP301 to 19 kHz ± 30 Hz.			USING ALTERNATE SYSTEM 1. Apply stereo signal from generator or stereo station to tuner. 2. Adjust **VR301** until stereo indicator lights up. Cement arm of **VR301** as shown in fig. 16.		



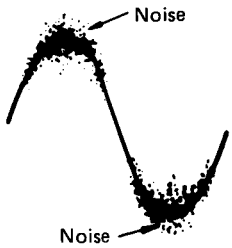
[Fig. 12]



[Fig. 13]

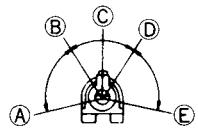


[Fig. 14]



AF output wave form

[Fig. 15]

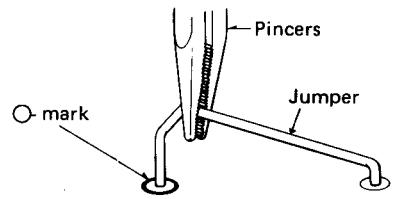


VR301

A – B, D – E Stereo OFF Position.
B – D Stereo ON Position. (indicator Lighting)
C Adjust Point of Pilot Circuit

[Fig. 16]

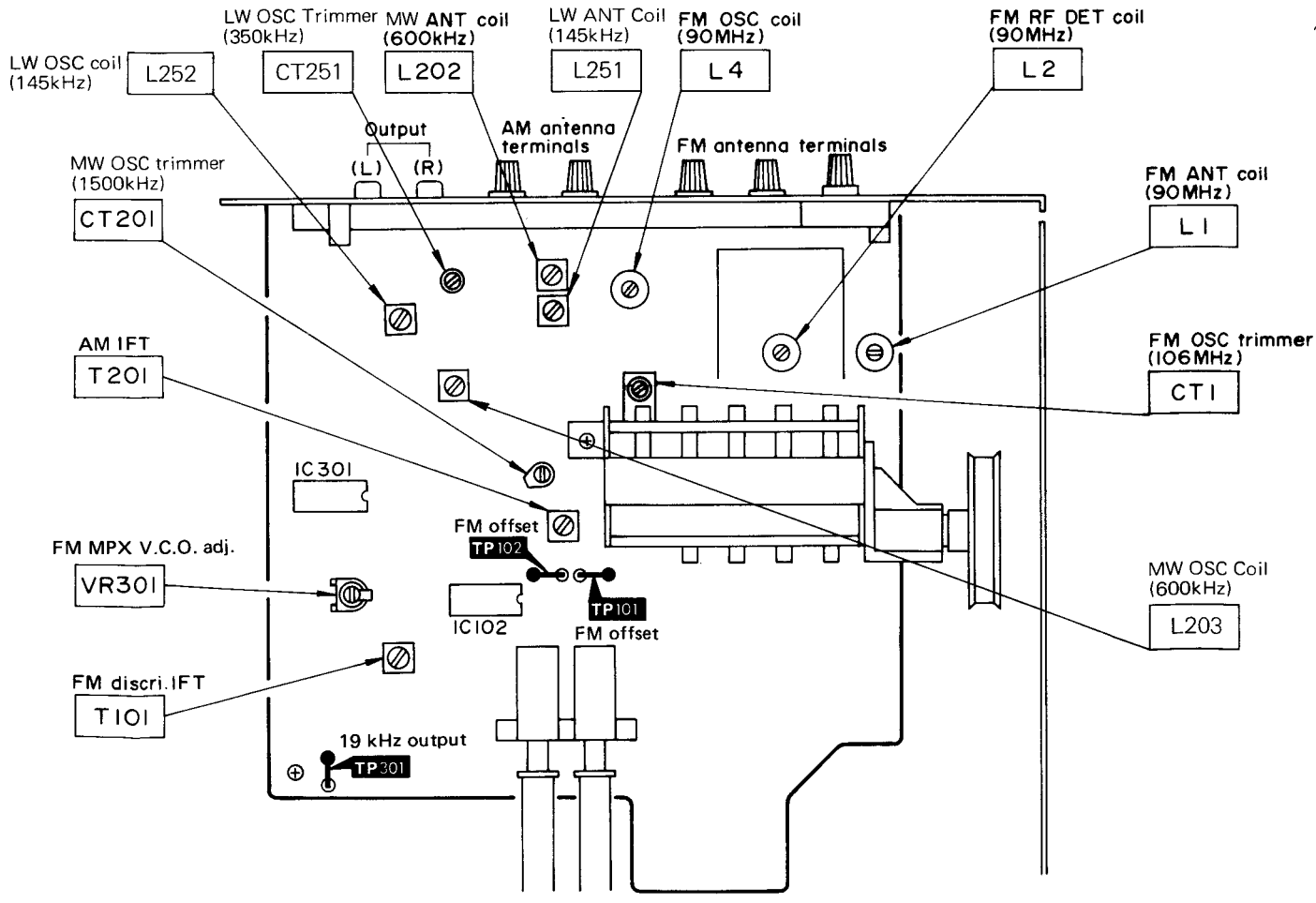
• About test point



It can be removed by pulling the O - marked side by use of pincers. Insert it into the original hole when not needed.

[Fig. 17]

• Adjustment points



■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "**S**" mark is service standard parts and may differ from production parts.
4. [K] - marked parts are used for black only, while ○ - marked parts are for silver type only.
5. Parts other than [K] - and ○ - marked are used for both black and silver types.
6. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Areas

* [EX] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [EF] is available in France.
* [EB] is available in Belgium.

Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC101		AN278	AM IF Amplifier
IC102		AN7273	FM/AM Detector
IC301		SVIUPC1161C3	FM MPX
TRANSISTORS			
Q1	S	2SK195–H1	FM RF Amplifier
Q2	S	2SC1674–M	FM Mixer
Q3	S	2SC1675–L	FM OSC
Q101	S	2SC1685–Q	Switching, Driver
Q401		2SD762–O	Regulator
Q501 ~ 503	S	2SC1685–Q	Switching, Driver
DIODES			
D101		MA27W–A	Detector
D302	S	MA162A	Switching
D401, 402	⚠ S	SVDSR1K2	Rectifier
D403		SVDMZ312C	12V, Zener
D504	S	MA162A	Switching
COILS			
L1		SLA4N15	FM Antenna
L2		SLD4P71–P	FM Detector
L3, 204, 305		SLQY15G5–O	Choke
L4		SLO4P103–P	FM OSC
L202		SLA2C3–P	AM Antenna
L203		SLO2C1–P	AM OSC
L251		SLA1C13–P	LW ANT Coil

Ref. No.	Part No.	Description
L252	SLO1C13–P	LW OSC Coil
TRANSFORMERS		
T101	SLI4C539–P	FM IFT
T201	SLI2C139–M	AM IFT
T401[EK] ⚠	SLT5K125	Power Source
T401[Other Areas] ⚠	SLT5K123	Power Source
CERAMIC FILTERS		
CF101, 102	SVFE107MS2–A	10.700 MHz (Red)
	SVFE107MS2–B	10.675 MHz (Blue)
	SVFE107MS2–C	10.725 MHz (Orange)
	SVFE107MS2–D	10.650 MHz (Black)
	SVFE107MS2–E	10.750 MHz (White)
CF201	SVFSFU450B3 (Use pair ranks as same as CF101 and CF102)	AM 450 kHz
VARIABLE CAPACITORS		
VC1 ~ 3, 201 202, CT1	ECV5MD34X93G	

Ref. No.	Part No.	Description
CT201	SVCTZ03T110F	MW OSC Trimmer
CT251	SVCTZ03R200F	AM Antenna
COMPONENT COMBINATION		
Z301, 302	EXRP181K473C	180pF x 1, 47kΩ x 1
SWITCHES		
S1	SSH2031	Muting
S2	SSH1051	Selector
S3 ⚠	SSH1043	Power Source
FUSES		
F1 ⚠	XBA2C04TR0	250V, 400mA
F2 ⚠	XBA2C03TR0	250V, 300mA
VARIABLE RESISTORS		
VR301 S	EVTS3MA00B53	FM MPX, 5kΩ (B)
LAMP		
PL1, 2 ⚠	XAMS3S150	8V, 0.1A

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SGW3710PA1	Panel, Front Ass'y (Silver)	(1)
1	[K]	SGW3710BA1	Panel, Front Ass'y (Black)	(1)
2		SGX7221	Ornament, Power	(1)
3		SBN1091	Knob, Tuning	(1)
4		SGX7313	Ornament, Selector	(1)
5		SBC337–1	Button, Power	(1)
6	○	SDH533–1	Ornament, Reflector (Silver)	(1)
6	[K]	SDH533–3	Ornament, Reflector (Black)	(1)
7		SHR401–1	Latch, Dial Scale	(1)
8		SBC433	Button, Selector	(2)
9		SGX7225	Ornament, Front Sub Panel	(1)
10	○	SGX7195–4	Panel, Front Sub Panel (Silver)	(1)
10	[K]	SGX7195–3	Panel, Front Sub Panel (Black)	(1)
11		SGU257	Transparent Plate	(1)
12		SDR31	Pulley, Dial	(3)
13		SDD31	Drum, Dial	(1)
14		SDSA4121	Spring, Dial	(1)
15		LN04181P–1	L.E.D. (with Holder)	(1)

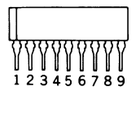
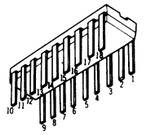
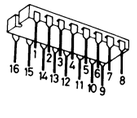
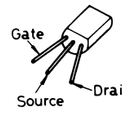
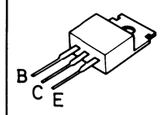
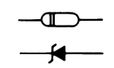
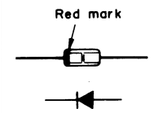
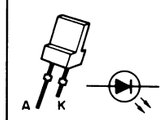
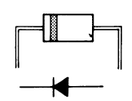
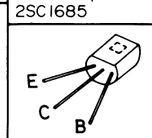
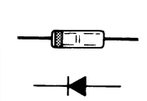
Ref. No.	Part No.	Description	
16	SUB71	Connection Rod	(1)
17	SUB91	Connection Rod	(2)
18 ○	SKD4374	Dial Scale (Silver)	(1)
18 [K]	SKD4374–1	Dial Scale (Black)	(1)
19	SHG1615	Rubber, Lamp	(2)
20 [EK] JPN	SGPTZ25LE	Panel, Rear Ass'y (W/Feed)(Made in JAPAN)	(1)
20 [Other Areas] JPN	SGPTZ25LF	Panel Rear Ass'y (W/Feed)(Made in JAPAN)	(1)
20 [EF] MEK	SGPTZ25LF–1	Panel, Rear Ass'y (W/Feed)(Made in U. K)	(1)
20–1	SKL277	Foot	(4)
21	SDT8095–1	Tuning Shaft	(1)
22	SJS5421	Socket, 4P	(1)
23	SJS5627	Socket, 6P	(1)
24	SHE129–1	Holder, P.C.B.	(1)
25	SHP61	Spacer, Dial	(1)
26	SDP1173	Pointer, Dial	(1)
27	SGP3110–1	Panel, Sub Rear	(1)
28 [EK] ⚠	QFC1205M	AC Cord	(1)
28 [Other Areas] ⚠	SJA88	AC Cord	(1)
29 [EK]	SHR129	Cord Bushing	(1)
29 [Other Areas]	SHR127	Cord Bushing	(1)

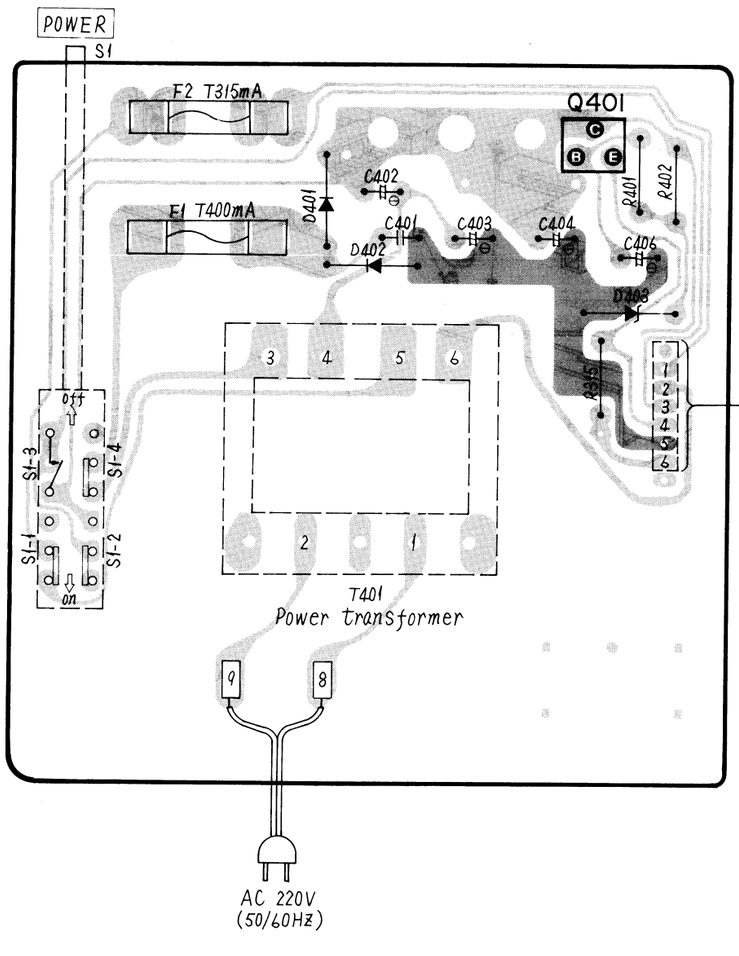
Ref. No.		Part No.	Description	
30		SJF8707N	Terminal Board	(1)
31		SJT347	Crip, Fuse	(4)
32	○	SKCTZ25E	Cabinet Ass'y (Silver)	(1)
32	[K]	SKCTZ25KE	Cabinet Ass'y (Black)	(1)
33		SDZ051–2	Dial Rope	1.8m
34		SMX595–1	Sheet	(1)
34 [EK] only		SMX555	Sheet	(1)
35		SUB99	Connection Rod	(1)
36		SHR301	Clamper	(1)
SCREWS				
N1	S	XTB3+8BFZ	Tapping, ⊕ 3 x 8	(5)
N2	S	XTV3+8C	Tapping, ⊕ 3 x 8	(2)
N3	S	XTB3+14BFN	Tapping, ⊕ 3 x 14	(1)
N4	S	XTB3+8BFN	Tapping, ⊕ 3 x 8	(2)
N5	S	XTB3+8BFN	Tapping, ⊕ 3 x 8	(5)
N6	S	XTB3+10BFZ	Tapping, ⊕ 3 x 10	(5)
N7	○	SNE2095–2	Cabinet, (Silver)	(4)
N7	[K]	SNE2095–1	Cabinet, (Black)	(4)

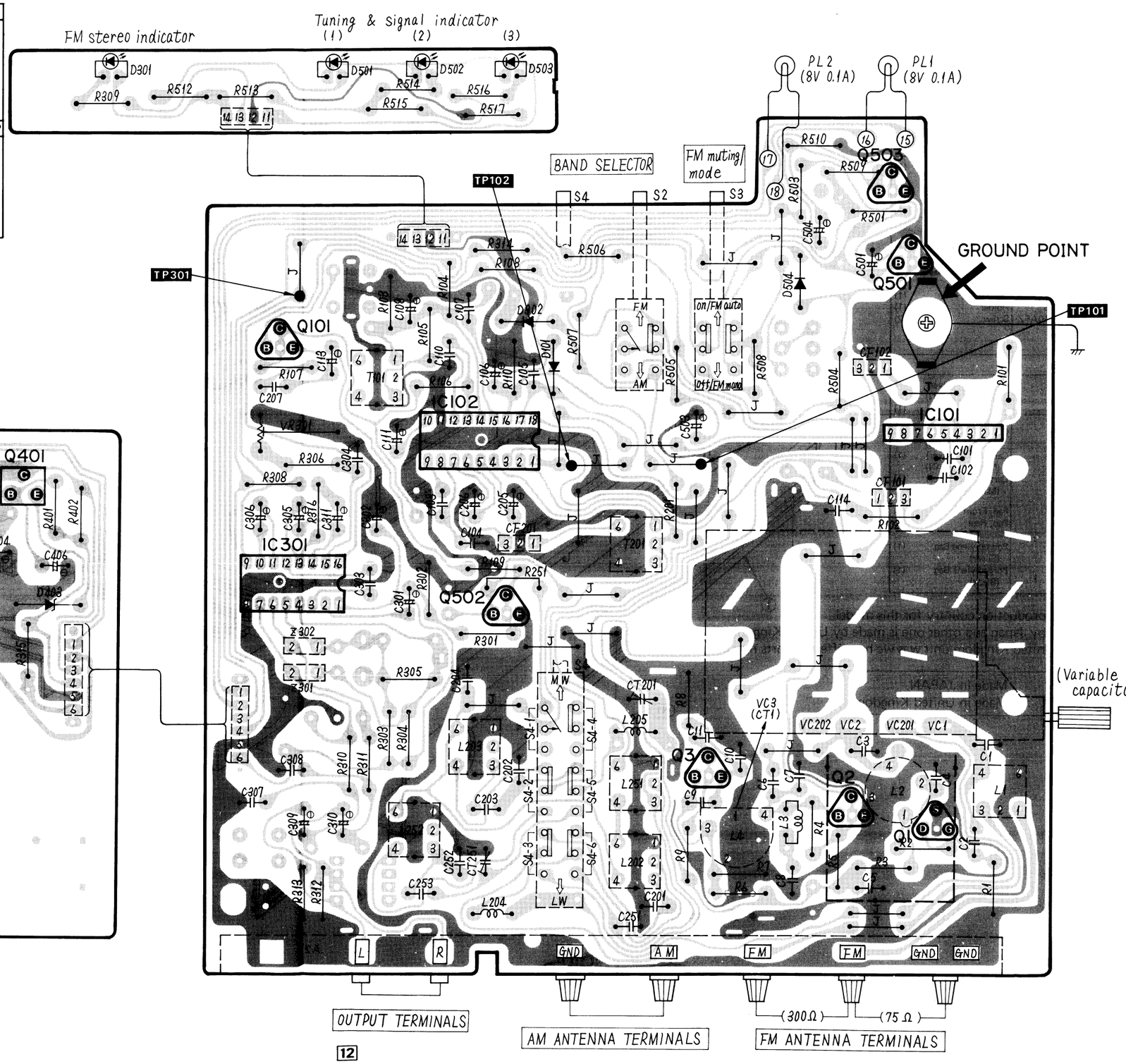
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines

- **Terminal guide of transistors, diodes and IC's**

AN278	AN7273	AN7470	2SK195
			
2SD762	**SVDMZ□□□□**	**MA27WA**	**LN224RP, LN424YP**
			
SVDSRIK2	**2SC1674, 2SC1675 2SC1685**	**MA150TA**	
			



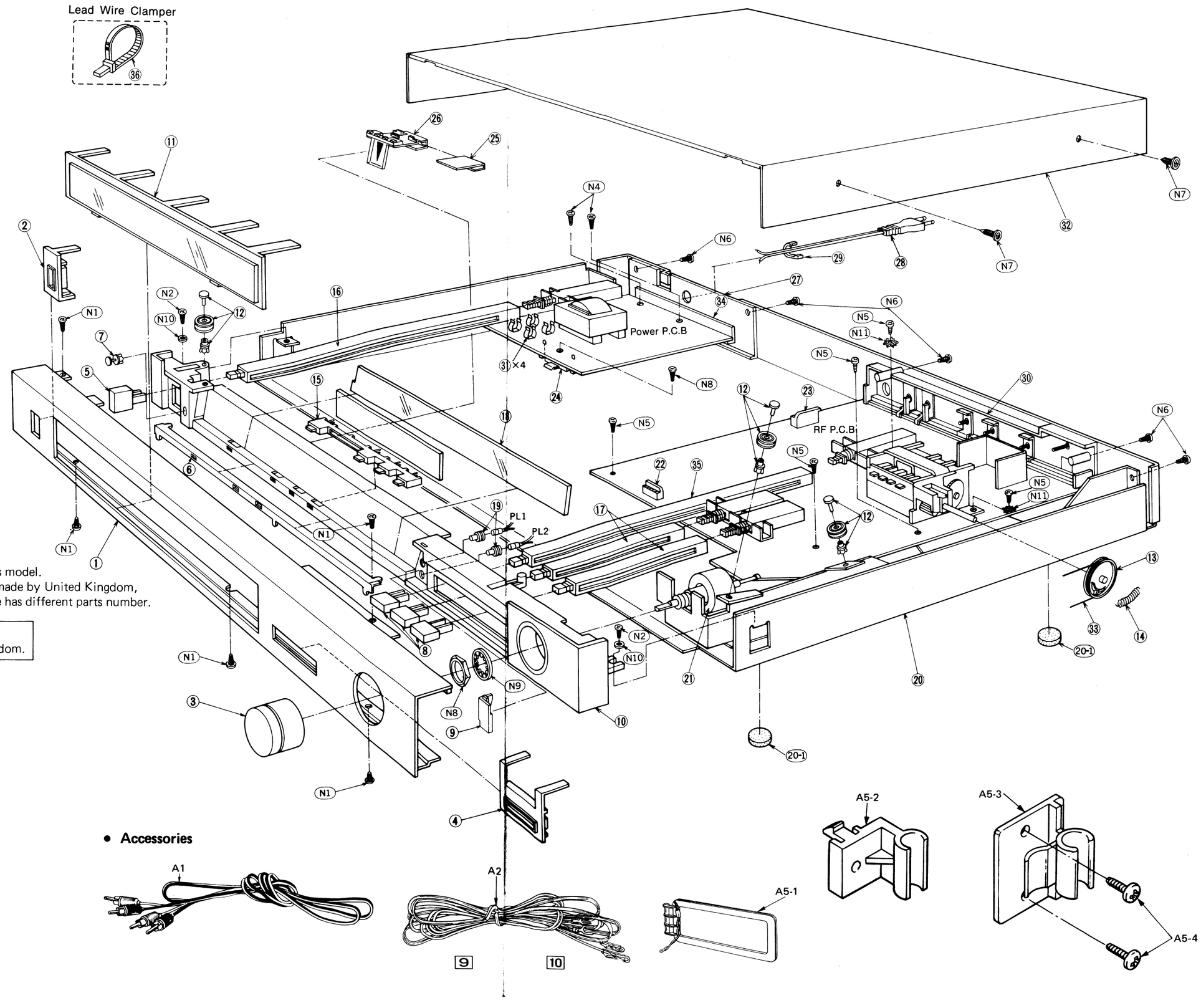


■ EXPLODED VIEWS

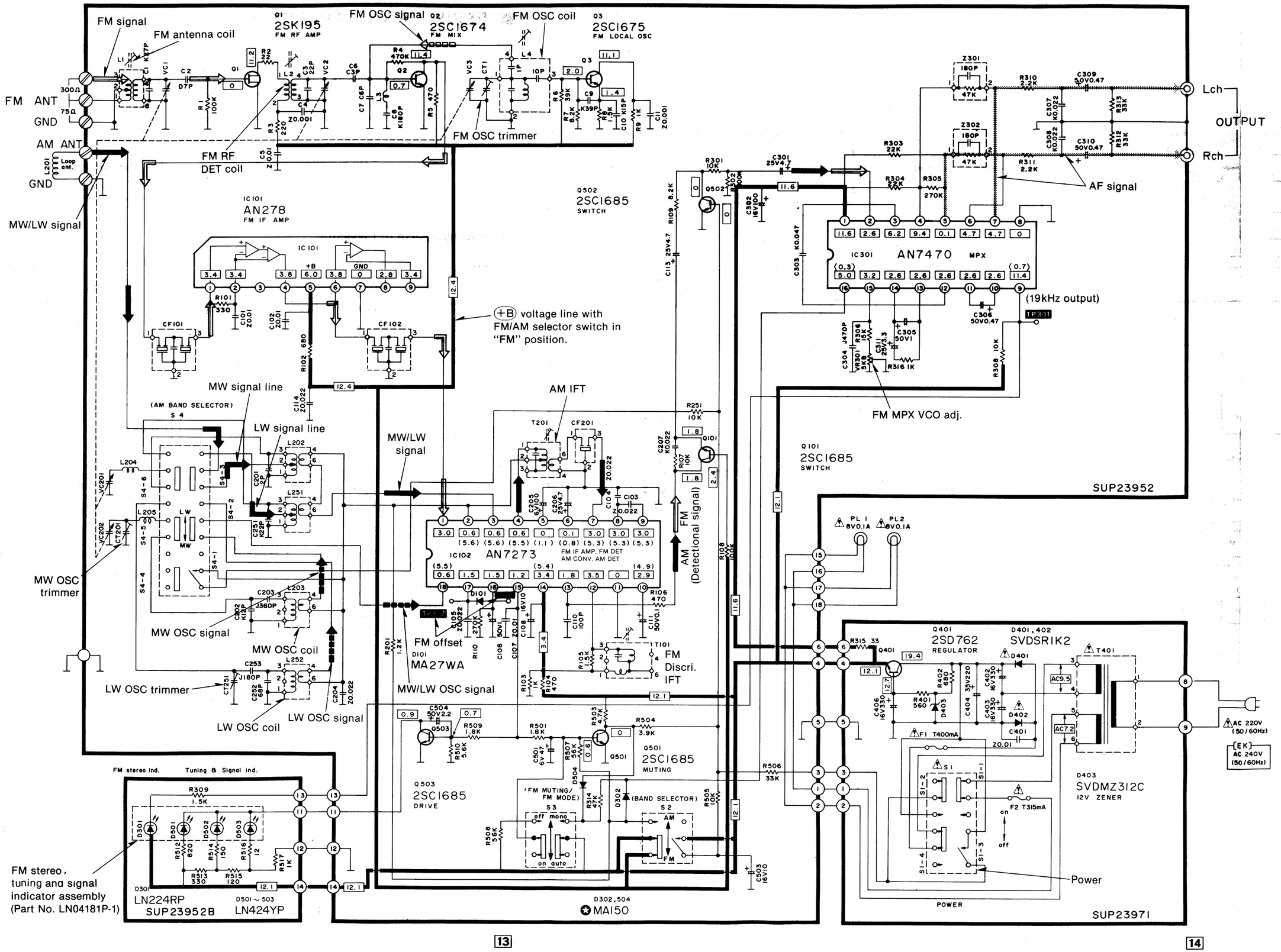
Ref. No.		Part No.	Description	
NUTS				
N8	S	XNS11	Tuning Shaft, φ11	(1)
N9	S	XWD11B	Tuning Shaft, φ11	(1)
WASHERS				
N10	S	XWG3	Plain, φ3	(2)
N11	S	XWC3B	Extarnal Toothed Lock, φ	(2)
ACCESSORIES				
A1		SJP2249	Cord	(1)
A2		SSA267	Antenna	(1)
A3 [EX, EB]		SQF11175	Instructions Book	(1)
A3 [EK]		SQF11295	Instructions Book	(1)
A4 [EF]		SQF11297	Instructions Book	(1)
A5		SPB869–1	Loop Antenna Ass'y	(1)
A5–1		SSA605–1	Antenna	(1)
A5–2		SMA231	Holder	(1)
A5–3		SMA233	Holder	(1)
A5–4		XTN3+10AFZ	Screw	(2)
PACKING PARTS				
P1 [EK]JPN		SPG3825	Carton Box (Silver) (Made in JAPAN)	(1)
P1 [EX, O EB] JPN		SPG3827	Carton Box (Silver) (Made in JAPAN)	(1)
P1 JPN	K	SPG3911	Carton Box (Black) (Made in JAPAN)	(1)
P1 [EF]JPN		SPG3829	Carton Box (Silver) (Made in JAPAN)	(1)
P1 [EF] MEK		SPG3831	Carton Box (Silver) (Made in MELUK)	(1)
P2		SPS3493	Pad, Front	(1)
P3		SPS3495	Pad, Rear	(1)
P4	O	SPP697	Polyethylene Bag (Silver)	(1)
P4	K	SPP647	Polyethylene Bag (Black)	(1)

* We have a two production country for this model.
One of a made by Japan and other one is made by United Kingdom,
The made by United Kingdom unit was we has different parts number.

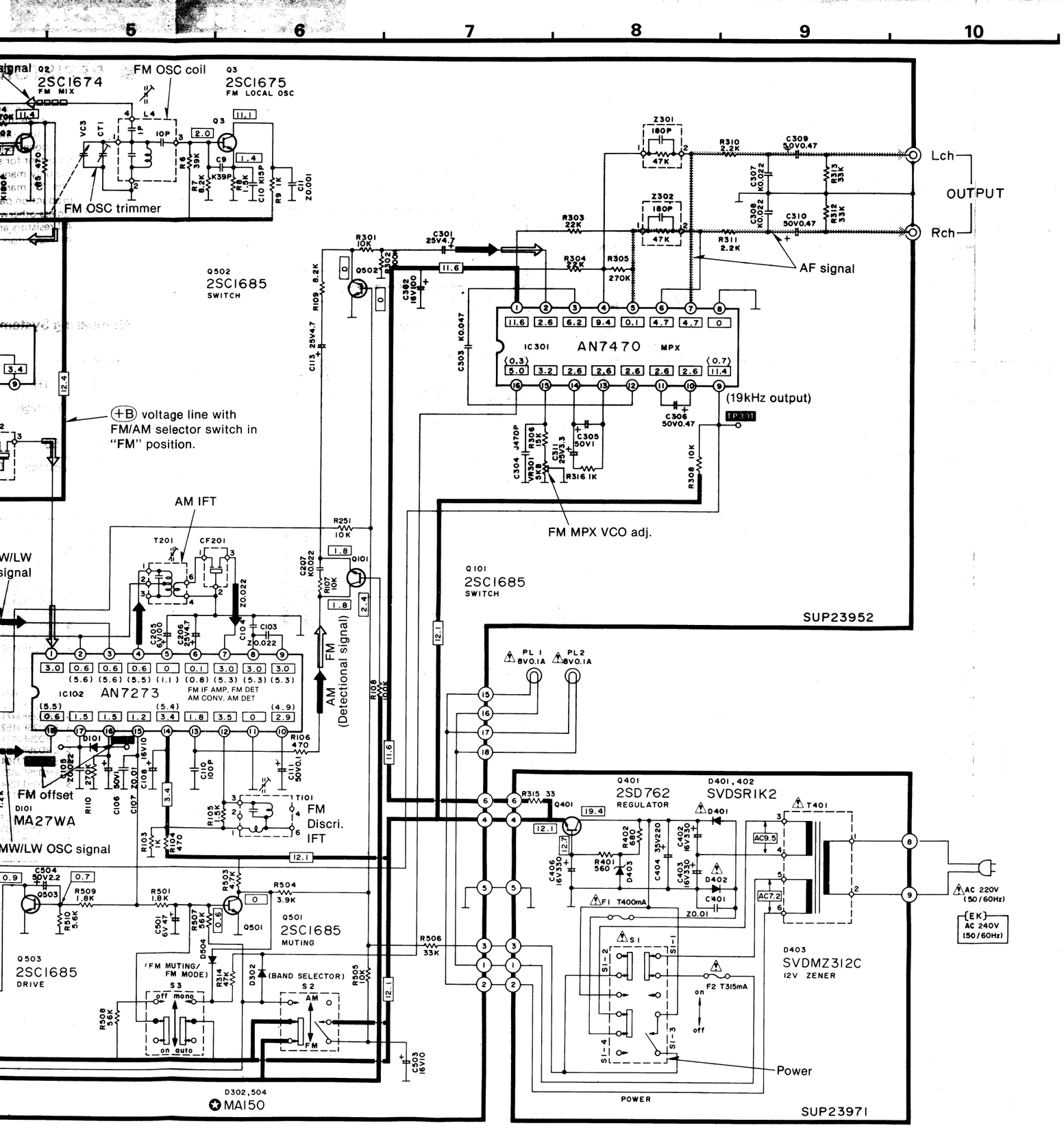
JPN	:	Made in JAPAN.
MEK	:	Made in United Kingdom.



● **Accessories**


FM signal
FM antenna coil
Q1 2SK195 FM RF AMP
FM OSC signal
Q2 2SC1674 FM MIX
FM OSC coil
Q3 2SC1675 FM LOCAL OSC
FM ANT
300Ω
75Ω
GND
AM ANT
GND
L201 Loop ant.
MW/LW signal
FM RF DET coil
FM OSC trimmer
IC101 AN278 FM IF AMP
Q502 2SC1685 SWITCH
(+B) voltage line with FM/AM selector switch in "FM" position.
MW signal line
LW signal line
(AM BAND SELECTOR) S4
MW OSC trimmer
MW OSC signal
MW OSC coil
LW OSC trimmer
LW OSC coil
LW OSC signal
MW/LW signal
AM IFT
IC102 AN7273 FM IF AMP, FM DET AM CONV. AM DET
FM (Detectional signal)
AM
FM offset
D101 MA27WA
MW/LW OSC signal
TI01 FM Discri. IFT
Q503 2SC1685 DRIVE
Q501 2SC1685 MUTING
(FM MUTING/ FM MODE) S3
(BAND SELECTOR) S2
D302,504 MA150
FM stereo ind.
Tuning & Signal ind.
FM stereo, tuning and signal indicator assembly (Part No. LN04181P-1)
D301 LN224RP SUP23952B
D501 ~ 503 LN424YP
IC301 AN7470 MPX
Z301 180P 47K
Z302 180P 47K
Lch
Rch
OUTPUT
AF signal
(19kHz output)
TP301
FM MPX VCO adj.
Q101 2SC1685 SWITCH
SUP23952
PL1 8V0.1A
PL2 8V0.1A
Q401 2SD762 REGULATOR
D401,402 SVDSR1K2
T401
AC 220V (50/60Hz)
(EK) AC 240V (50/60Hz)
F1 T400mA
S1
F2 T315mA
D403 SVDMZ312C 12V ZENER
Power
POWER
SUP23971

13 14



13 14

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

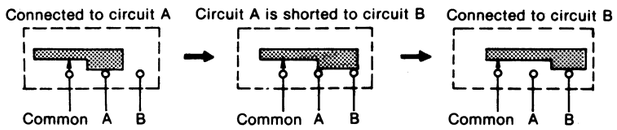
Notes:

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. without ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement parts, please use the part No. in the replacement parts list.

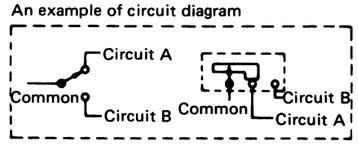
1. **S1** : Power source switch in "**on**" position.
2. **S2** : Band selector switch in "**FM**" position
   FM◄►AM
3. **S3** : FM muting/FM mode selector switch in "**on/FM auto**" position.
   on/FM auto◄►off/FM mono
4. **S4** : AM band selector switch in "**MW**" position.
   MW◄►LW
5. Indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the chassis taken values, depending on the internal impedance of the DC circuit tester.
   * Figures in ☐ stand for DC voltage in FM/AM signal reception mode.
   * Figures in ‹ › stand for DC voltage in FM stereo signal reception mode.
   * Figures in ( ) stand for DC voltage with the band selectors circuit set at AM.
6. Signal lines
   ⇨/▭▭▭⇨ FM signal ▬▬ Positive (+B) voltage line
   ▒▒▒ Audio frequency signal ➡/▬▬➡ AM signal
7. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts. MW/LW band selector switch
8. Power switch (S1-3) FM/AM band selector switch (S2-2) and, AM band selector switch is muting switch, which works to short the circuit only when the switch turned on or off.

Shorting Switch

This unit uses a shorting switch. As illustated below, the circuit is shorted to the next circuit without being opened.
In the circuit diagram, the shaded area represents the common terminal.



An example of circuit diagram



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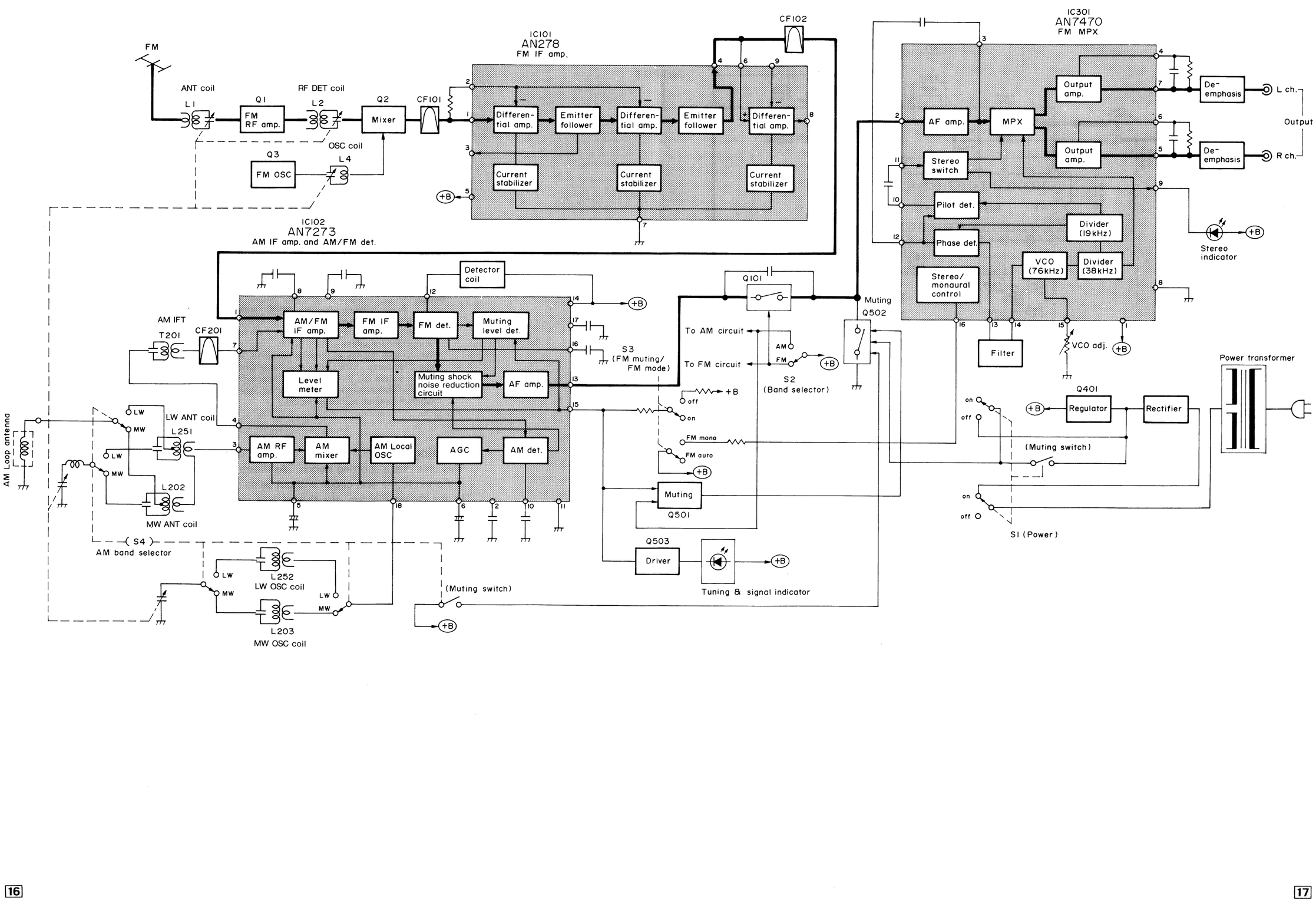
■ BLOCK DIAGRAM



■ RESISTO

Notes: 1. Part numb
Please use
2. Important
Compone
mportant
use only r
3. The "**S**" r
productio
4. Unless oth
All resisto
All capaci

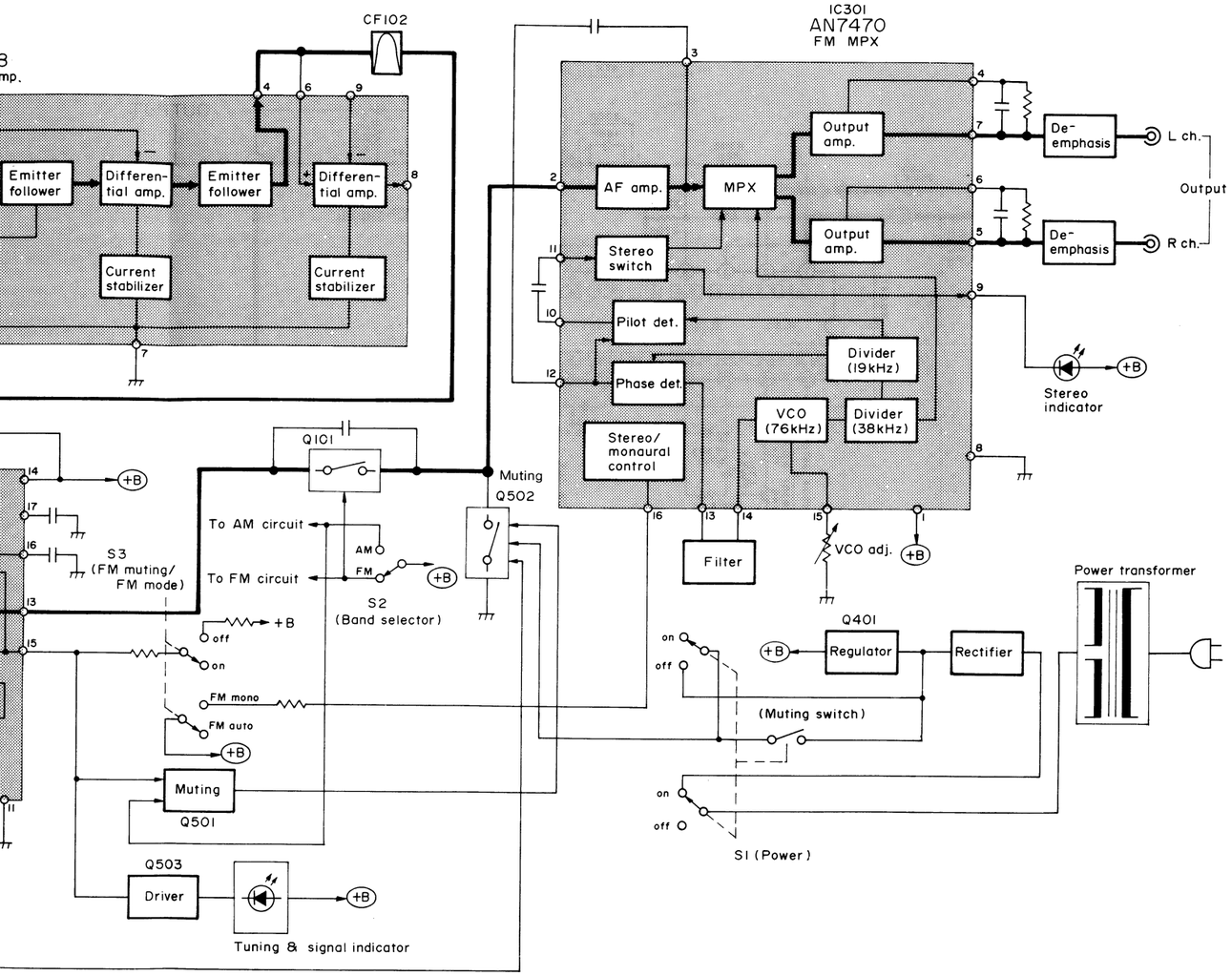
Numbering Syst

Example :

ECKD	1H
Type	Voltage

ECEA	50
Type	Voltage

Ref. No.		Part N
RESISTORS		
R1	**S**	ERD25T
R2	**S**	ERD25F
R3	**S**	ERD25F
R4	**S**	ERD25T
R5	**S**	ERD25F
R6	**S**	ERD25T
R7	**S**	ERD25F
R8	**S**	ERD25F
R9	**S**	ERD25F
R101	**S**	ERD25F
R102	**S**	ERD25F
R103	**S**	ERD25F
R104	**S**	ERD25F
R105	**S**	ERD25F
R106	**S**	ERD25F
R107	**S**	ERD25F
R108	**S**	ERD25T
R109	**S**	ERD25F
R110	**S**	ERD25T
R201	**S**	ERD25F
R251	**S**	ERD25F
R301	**S**	ERD25F
R302	**S**	ERD25T
R303, 304	**S**	ERD25T



■ RESISTORS & CAPACITORS

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics mportant for safety. When replacing any of these compoinents use only manufacturer's specified parts.
3. The "**S**" mark is service standard parts and may differ from production parts.
4. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (μF) P = μμF

Numbering System of Resistor

Example :

ERD	25	F	J	101
Type	Wattage	Shape	Tolerance	Value

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : ± 5%

Numbering System of Capacitor

Example :

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage	Peculiarity use	Value	Special use

Capacitor Type	Voltage		Tolerance
	ECEA Type	Others	
ECEA : Electrolytic	1A : 10V	1H : 50V DC	C : ±0.25pF
ECCD : Ceramic	1C : 16V	1 : 100V	J : ±5%
	1E : 25V		K : ±10%
ECKD : Ceramic	1H : 50V		Z : +80%, −20%
	1V : 35V		
ECQM : Polyester	50Z : 50V		
ECQP : Polypropylene	25Z : 25V		

Ref. No.		Part No.	Value
RESISTORS			
R1	S	ERD25TJ104	100k
R2	S	ERD25FJ220	22
R3	S	ERD25FJ221	220
R4	S	ERD25TJ474	470k
R5	S	ERD25FJ471	470
R6	S	ERD25TJ393	39k
R7	S	ERD25FJ822	8.2k
R8	S	ERD25FJ152	1.5k
R9	S	ERD25FJ102	1k
R101	S	ERD25FJ331	330
R102	S	ERD25FJ681	680
R103	S	ERD25FJ102	1k
R104	S	ERD25FJ471	470
R105	S	ERD25FJ152	1.5k
R106	S	ERD25FJ471	470
R107	S	ERD25FJ103	10k
R108	S	ERD25TJ104	100k
R109	S	ERD25FJ822	8.2k
R110	S	ERD25TJ274	270k
R201	S	ERD25FJ122	1.2k
R251	S	ERD25FJ103	10k
R301	S	ERD25FJ103	10k
R302	S	ERD25TJ104	100k
R303, 304	S	ERD25TJ223	22k
R305	S	ERD25TJ274	270k
R306	S	ERD25TJ153	15k
R308	S	ERD25FJ103	10k
R309	S	ERD25FJ152	1.5k
R310, 311	S	ERD25FJ222	2.2k
R312, 313	S	ERD25TJ333	33k
R314	S	ERD25TJ473	47k
R315	⚠ S	ERD25FJ330	33
R316	S	ERD25FJ102	1k
R401	S	ERD25FJ561	560
R402	⚠ S	ERD25FJ681	680
R501	S	ERD25FJ182	1.8k
R503	S	ERD25FJ472	4.7k
R504	S	ERD25FJ392	3.9k
R505	S	ERD25FJ103	10k
R506	S	ERD25TJ333	33k
R507, 508	S	ERD25TJ563	56k
R509	S	ERD25FJ182	1.8k
R510	S	ERD25FJ562	5.6k
R512	S	ERD25FJ821	820
R513	S	ERD25FJ331	330
R514	S	ERD25FJ151	150
R515	S	ERD25FJ121	120
R516	S	ERD25FJ120	12
R517	S	ERD25FJ102	1k

Ref. No.		Part No.	Value
CAPACITORS			
C1	S	ECCD1H270KC	27P
C2	S	ECCD1H070CC	7P
C3	S	ECCD1H220KC	22P
C4	S	ECKD1H102ZF	0.001
C5	S	ECKD1H103ZF	0.01
C6	S	ECCD1H030CC	3P
C7	S	ECCD1H060CC	6P
C8	S	ECCD1H181K	180P
C9	S	ECCD1H390KC	39P
C10	S	ECCD1H150KC	15P
C11	S	ECKD1H102ZF	0.001
C101, 102	S	ECKD1H103ZF	0.01
C103, 104	S	ECKD1H223ZF	0.022
C105	S	ECKD1H223ZF	0.022
C106	S	ECEA50Z1	1
C107	S	ECKD1H103ZF	0.01
C108	S	ECEA1HS100	10
C110	S	ECCD1H101K	100P
C111	S	ECEA50ZR1	0.1
C113	S	ECEA25Z4R7	4.7
C114	S	ECKD1H223ZF	0.022
C201	S	ECCD1H020CC	2P
C202	S	ECCD1H120KC	12P
C203		ECQP1361JZ	360P
C204	S	ECKD1H223ZF	0.022
C205	S	ECEA1AS101	100
C206	S	ECEA25Z4R7	4.7
C207	S	ECQM1H223JZ	0.022
C251	S	ECCD1H220KC	22P
C252	S	ECCD1H680KC	68P
C253		ECQP1181JZ	180P
C301	S	ECEA25Z4R7	4.7
C302	S	ECEA1ES101	100
C303	S	ECQM1H473JZ	0.047
C304		ECQP1471JZ	470P
C305	S	ECEA50Z1	1
C306	S	ECEA50ZR47	0.47
C307, 308	S	ECQM1H223JZ	0.022
C309, 310	S	ECEA50ZR47	0.47
C311	S	ECEA50Z3R3	3.3
C401	S	ECKD1H103ZF	0.01
C402, 403	S	ECEA1CS331	330
C404	S	ECEA1VS221	220
C406	S	ECEA1CS331	330
C501	S	ECEA1AS470	47
C503	S	ECEA1HS100	10
C504	S	ECEA50Z2R2	2.2

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